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Werling

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(54) **SYSTEM AND METHOD OF ASSEMBLING A VEHICLE BODY GARNISH**

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B60R 13/04	(2006.01)
B62D 65/06	(2006.01)
B23K 31/02	(2006.01)
B60J 5/04	(2006.01)

(52) **U.S. Cl.**
CPC ***B60J 5/107*** (2013.01); ***B23K 31/02*** (2013.01); ***B60R 13/04*** (2013.01); *B60J 5/0463* (2013.01); *B62D 65/06* (2013.01)

(58) **Field of Classification Search**
CPC B60J 5/0463; B60J 5/10; B60J 5/107; B60R 13/04; B62D 25/10; B62D 25/105; B62D 25/16; B62D 65/02; B62D 65/06
USPC 296/50, 56, 146.5, 146.6, 146.8, 198
See application file for complete search history.

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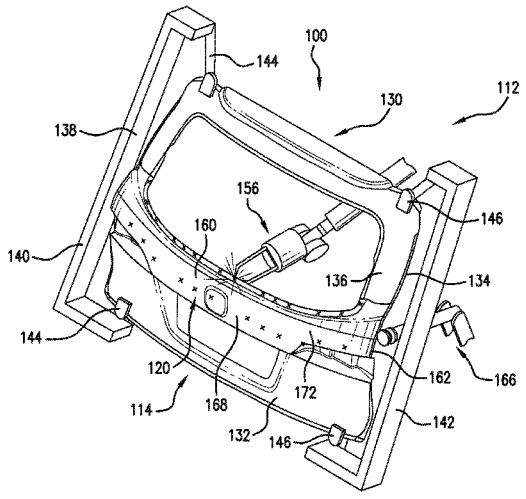
(57) **ABSTRACT**

A vehicle assembly comprises a structural component that defines a portion of a vehicle body and a garnish member. The structural component is formed of a first metal. The garnish member is formed of the first metal and is fixedly attached via welding or hemming directly to the structural component in a same welding station of a vehicle assembly line as the assembly of the structural component. The garnish member includes a body having an outer surface which defines an exterior surface of the vehicle body.

20 Claims, 4 Drawing Sheets



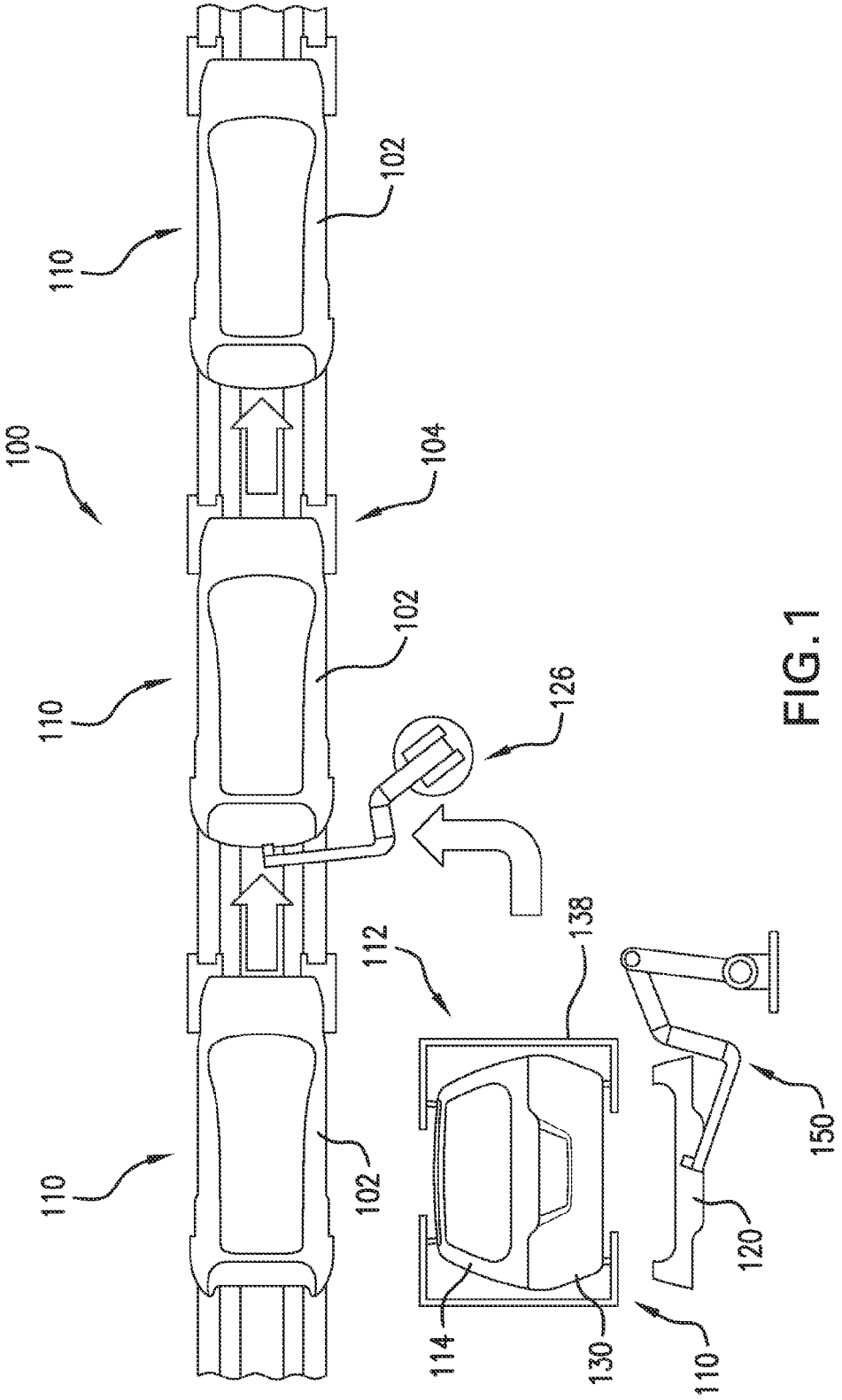


FIG. 1

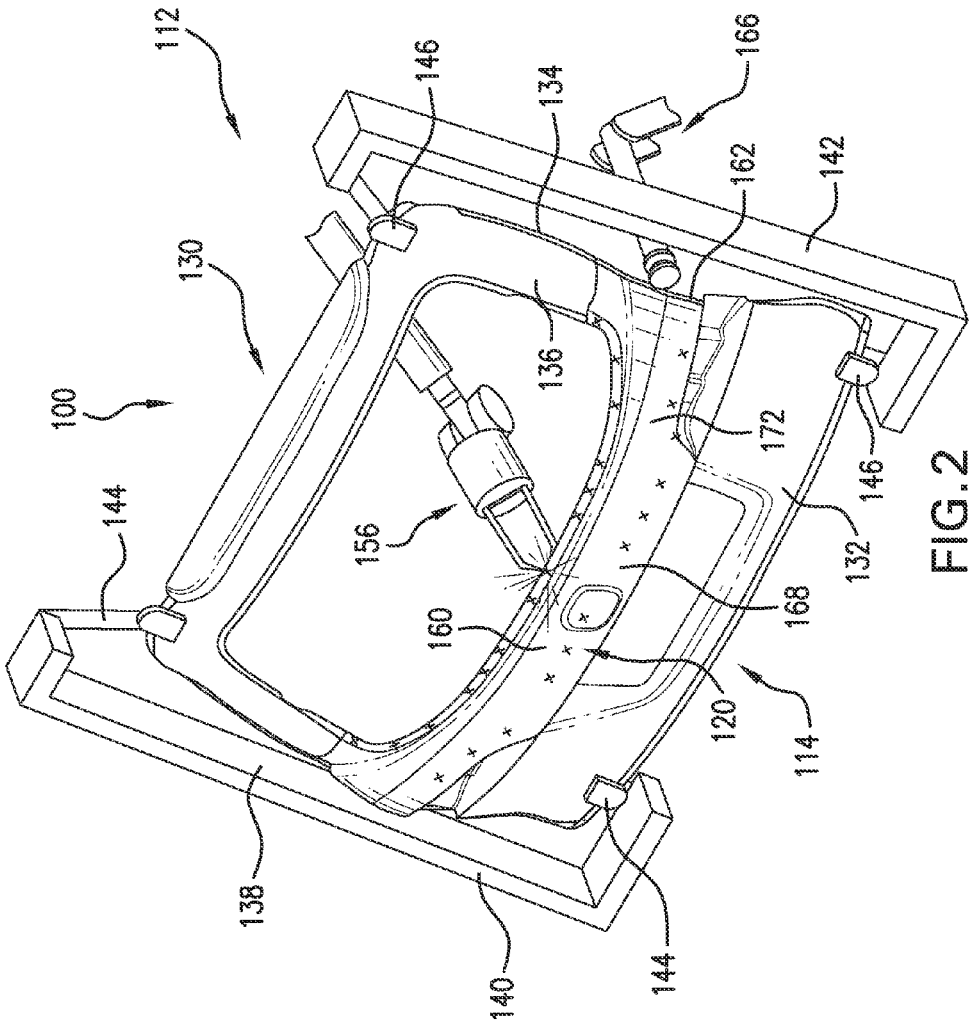

112
146
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FIG. 2

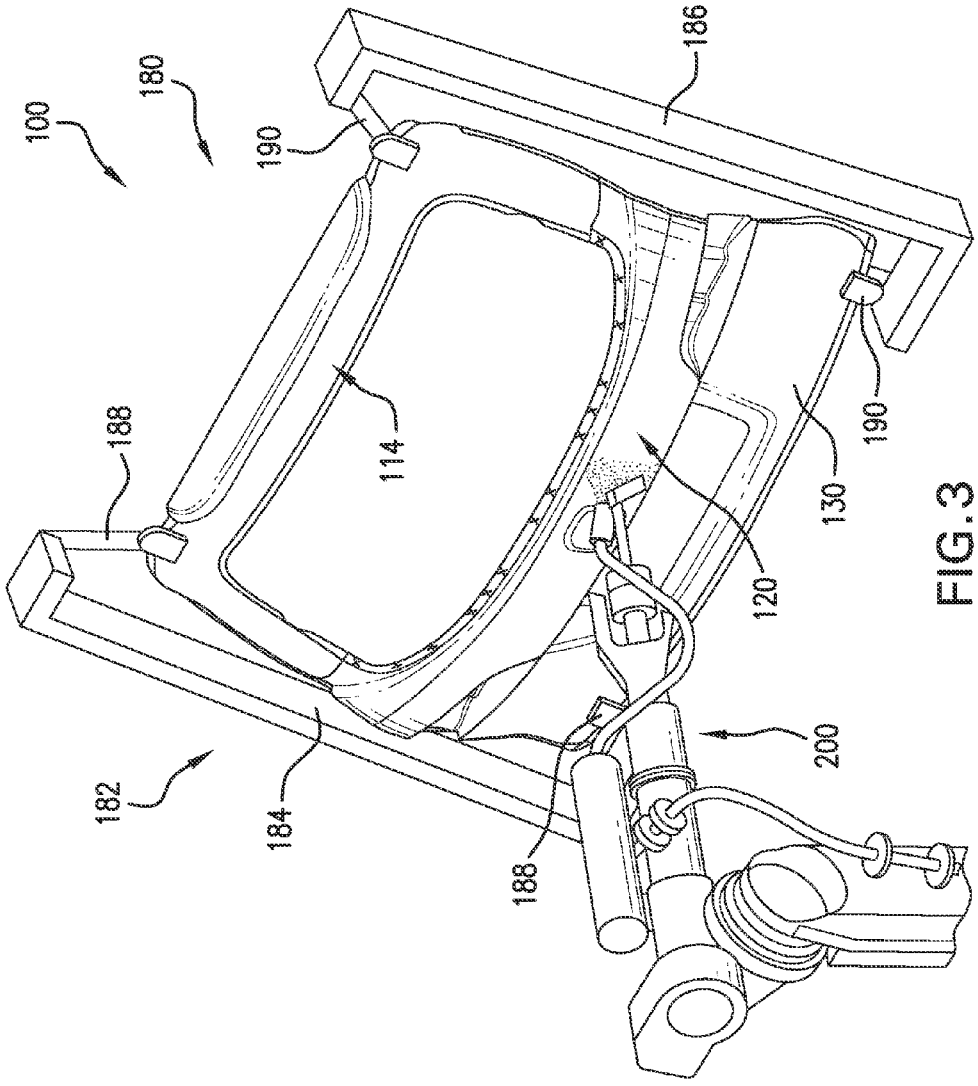

FIG. 3

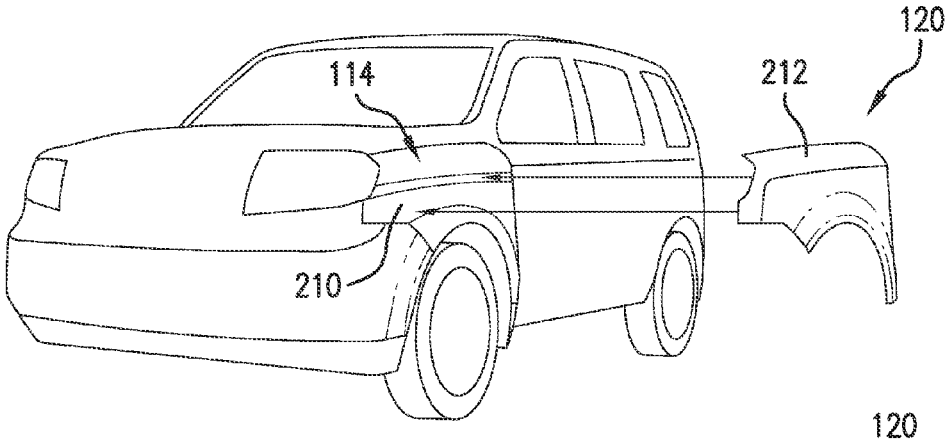

FIG.4

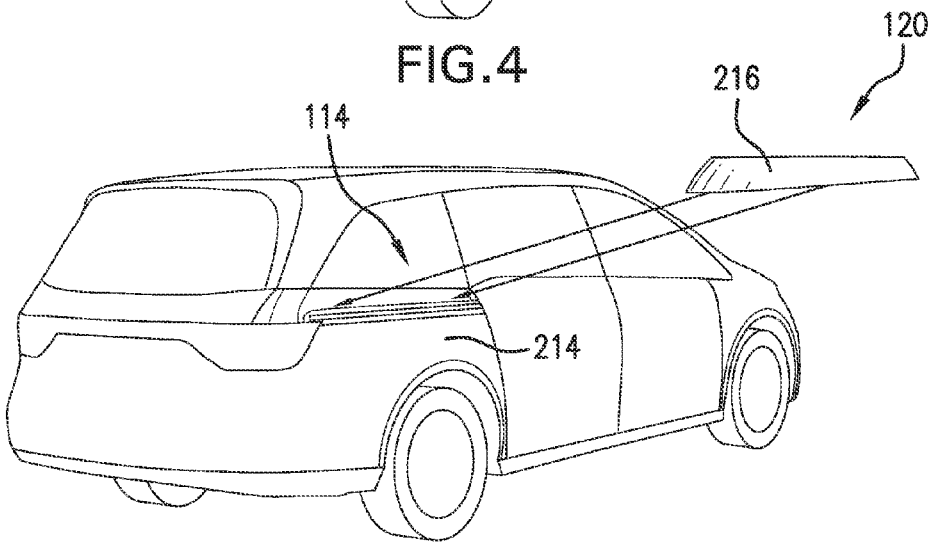

FIG.5

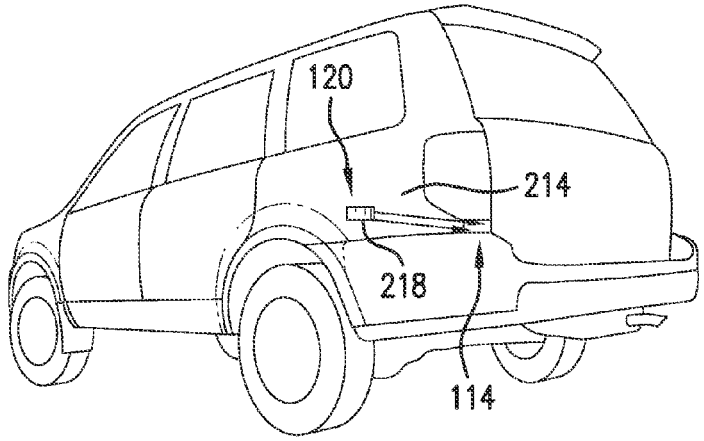

FIG.6

SYSTEM AND METHOD OF ASSEMBLING A VEHICLE BODY GARNISH

BACKGROUND

In the manufacture or assembly of a vehicle body, it is known to have a vehicle body assembly line including a plurality of designated work stations in which the vehicle body is assembled and forwarded as the assembly work proceeds. Typically, the major structural components of the vehicle body are welded together in a general welder (i.e., one of the stations of the assembly line wherein primary welding operations are performed to connect the vehicle body components to create the body-in-white body). The vehicle body is then transferred to a painting station for the start of the painting process.

Current vehicle body designs use plastic garnishes or bolted on parts to cover certain portions of the assembled vehicle body that cannot meet styling or design requirements. Generally, these plastic garnishes are attached through metal brackets that are affixed (via welding or fasteners) to the vehicle body. Plastic garnishes have a higher cost and usually do not offer structural reinforcement to that portion of the vehicle body. In addition, bolted on parts require additional manpower which can lead to inconsistent fit of the garnish on the vehicle body portion.

BRIEF DESCRIPTION

In accordance with one aspect, a vehicle assembly comprises a structural component that defines a portion of a vehicle body and a garnish member. The structural component is formed of a first metal. The garnish member is formed of the first metal and is fixedly attached directly via welding or hemming to the structural component in a same welding station of a vehicle assembly line as the assembly of the structural component. The garnish member includes a body having an outer surface which defines an exterior surface of the vehicle body.

In accordance with another aspect, a system for assembling a vehicle body comprises a vehicle assembly line having a plurality of stations including a welding station and a paint station located downstream of the welding station. The welding station is adapted to receive and weld a structural component that defines a body component of a vehicle body. The structural component is formed of a first metal. The welding station is further adapted to receive a garnish member formed of the first metal and weld the garnish member directly to the structural component. The garnish member defines an exterior surface of the vehicle body. The painting station is adapted to receive and paint the structural component and the garnish member welded thereto.

In accordance with yet another aspect, a method of assembling a vehicle body comprises assembling a vehicle body structural component formed of a first metal in a vehicle assembly line; transferring the assembled structural component to a welding station of the vehicle assembly line; providing a garnish member formed of the first metal, the garnish member defines an exterior surface of the vehicle body, and transferring the garnish member to the welding station; setting the garnish member in position relative to the structural component in the welding station; and welding the garnish member directly to the structural component.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view of a portion of a vehicle body assembly line.

FIG. **2** is a schematic view of a garnish member being fixedly attached to a vehicle body structural component in a welding station of the vehicle body assembly line.

FIG. **3** is a schematic view of the vehicle body structural component with the garnish member fixed thereto being painted in a painting station of the vehicle body assembly line.

FIGS. **4**, **5** and **6** are schematic views of alternative garnish members which can be fixed to vehicle body structural components in a common welding station of the vehicle body assembly line.

DETAILED DESCRIPTION

It should, of course, be understood that the description and drawings herein are merely illustrative and that various modifications and changes can be made in the structures disclosed without departing from the present disclosure. It will be appreciated that the various identified components of the exemplary system/method for assembling a vehicle body disclosed herein are merely terms of art that may vary from one manufacturer to another and should not be deemed to limit the present disclosure.

Referring now to the drawings, wherein like numerals refer to like parts throughout the several views, FIG. **1** schematically illustrates a system **100** for assembling a vehicle body **102** according to the present disclosure. The system **100** generally includes a vehicle body assembly line **104** having a plurality of work stations **110**, including at least one welding station **112** for forming and welding structural components **114** (e.g., a trunk lid or tailgate, left and right side panels, and left and right quarter panels) to a vehicle frame (not shown) that define different portions of the vehicle body **102**. The structural components **114** are formed of a first metal, such as a steel or steel-based alloy or an aluminum or aluminum-based alloy. As will be discussed in greater detail below, the welding station **112** is adapted to fixedly attach a garnish member **120** (e.g., a trunk lid or tailgate skin, a fender, a slide door rail cover, and a side panel extension) to a corresponding structural component **114**. The garnish member **120** can be similar to the known plastic garnishes in that the garnish member **120** covers portions of the vehicle body **102** that do not meet styling or design requirements.

According to the present disclosure, however, the garnish member **120** is formed of a metal similar to that of the structural component **114**, which allows for the welding of the garnish member **120** directly to the structural component **114**. This allows the garnish member **120** to be configured as a second structural component adding strength and rigidity to the structural component **114** and, in turn, the vehicle body **102**. According to one aspect, the garnish member **120** is entirely formed of the first metal; although, this is not required. It should be appreciated that once the garnish member **120** is properly fixed directly to the structural component **114**, a robot-guided handling device **126** can releasably engage the structural component **114** with the garnish member **120** fixed thereto and set the structural component on the vehicle body **102** located on the assembly line **104**. Once assembled, the vehicle body **102** can then be transferred to another work station downstream from the welding station **112**.

With reference to FIGS. **1** and **2**, the structural component **114**, shown as a trunk lid or tailgate **130**, is positioned in the welding station **112**. The tailgate **130** includes a body **132** having a peripheral edge portion **134**. The body **132** is generally defined by an outer panel member **136** secured to an inner panel member (not shown) and, optionally, a reinforce-

ment (not shown) interposed between the outer and inner panel members. For example, the outer panel member **136**, inner panel member (not shown) and reinforcement (not shown) can have respective flange portions having complementary forms which nest and are welded together in the welding station **112**. A fixture **138** located in the welding station **112** is adapted to receive and secure the assembled structural component **114** (i.e., tailgate **130**). It should be appreciated that the configuration of the fixture **138** in the welding station **112** can be dependent on the structural component **114** being retained thereby. By way of example, with the depicted tailgate **130**, the fixture **138** includes side support members **140**, **142** located laterally outwardly of the peripheral edge portion **134** of the tailgate **130**. Each side member **140**, **142** can include a pair of respective clamp mechanisms **144**, **146** which engage the peripheral edge portion **134**. Once properly secured to the fixture **138**, a second robot-guided handling device **150** provided at the welding station **112** releasably engages the garnish member **120** (e.g., a tailgate skin) and moves the garnish member **120** into position relative to the tailgate **130**. It should be appreciated that the second robot-guided handling device **150** can be provided with at least one suction device for retaining the garnish member **120**. This allows the second robot-guided handling device **150** to maintain the proper positioning of the garnish member **120** prior to attachment to the structural component **114**. The fixture **138** can also be provided with additional clamp mechanisms (not shown) for temporarily connecting the garnish member **120** to the structural component **114**.

As is shown in FIG. **2**, with the structural component **114** and garnish member **120** being formed of similar metals, the garnish member **120** can be fixed to the structural component **114** in the same welding station **112** of a vehicle assembly line **102** as the assembly of the structural component **114**. By way of example, at least one weld robot **156** located in the welding station **112** welds a first portion **160** of the garnish member **120** directly to the body **132** of structural component **114**. According to one aspect, to further secure the garnish member **120** to the structural component **114**, a second portion **162** of the garnish member **120** is hemmed to the peripheral edge portion **134** of the structural component **114** via a hemming robot **166** located in the welding station **112**. When properly secured to the structural component **114**, an outer surface **168** of a body **172** of the garnish member **120** defines an exterior surface of the structural component **114**, and, in turn, an exterior surface of the vehicle body **102**.

As indicated previously, and according to one aspect, the robot-guided handling device **126** sets the structural component **114** with the garnish member **120** fixed thereto on the vehicle body **102** located on the assembly line **104**. The vehicle body **102** can then be transferred to a painting station **180** (FIG. **3**) of the assembly line **104** downstream from the welding station **112**. The painting station **180** is adapted to receive and simultaneously coat or paint the structural component **114** and the garnish member **120**. By way of example, the painting station **180** can include a fixture **182** having a configuration similar to the fixture **138** provided in the welding station **112**. The fixture **182** includes side support members **184**, **186** having a pair of respective clamp mechanisms **188**, **190** which engage the structural component **114** and the garnish member **120**. A robot-guided painting device **200** provided at the painting station **180** simultaneously coats or paints the structural component **114** and the garnish member **120**. However, as is well known in the art, it should be appreciated that the assembled vehicle body **102** (i.e., the vehicle body having each structural component **114** and its corresponding garnish member **120** secured thereto) can be transferred to a painting station of the assembly line adapted to coat or paint the assembled vehicle body **102**. By having the garnish member **120** coated or painted simultaneously with the structural component **114**, a uniform color for the vehicle body can be achieved.

As is evident from the foregoing, the present disclosure provides a system **100** wherein a part **120** is welded and optionally hemmed to a structural component **114** of a vehicle body **102** in a common welding station **112** of the vehicle assembly line **104**. This allows for the part to function as a garnish member **120**, covering portions of the structural component **114** that can not be met by other parts due to formability or function. It should be appreciated that various structural components **114** and corresponding garnish members **120** are contemplated. For example, as shown in FIGS. **1-3**, the structural component **114** can be a trunk lid or tailgate **130** and the garnish member **120** is a trunk lid skin. As shown in FIG. **4**, the structural component **114** can be a quarter panel **210** and the garnish member **120** is a fender **212**. As shown in FIGS. **5** and **6**, the structural component **114** can be a side panel **214** and the garnish member **120** is one of a slide door rail cover **216** and a side panel extension **218**.

As indicated previously, one benefit of the present disclosure is that the garnish member **120** can also be configured as a secondary structural component, adding strength and rigidity to the complete structural component assembly. The garnish member **120** will consistently maintain its location due on the structural component **114** to the garnish member being welded directly to the structural component **114**. Another benefit provided by the exemplary system **100** is the provision of additional process time to allow for an increase in welding capacity for improved vehicle body rigidity. Welding the garnish member **120** allows for more time in assembly or final weld due to not having to assemble a separate garnish to the structural component as is common in vehicle body assembly. And the connection between the garnish member **120** and the structural component **114** is devoid of an associated fastener or an associated bracket thereby reducing the manpower needed to assemble the vehicle body **102**. Further, when the part/garnish member **120** is to be color matched to the structural component **114**, there is no difference in color that is found with known plastic garnishes. This construction will allow for a lower cost and more consistent appearance for the assembled structural component **114**.

The present disclosure further provides a method of assembling a vehicle body **102** comprising assembling a vehicle body structural component **114** formed of a first metal in a vehicle assembly line **104**; transferring the assembled structural component **114** to a welding station **112** of the vehicle assembly line; providing a garnish member **120** formed of the first metal, the garnish member **120** defines an exterior surface of the vehicle body **102**, and transferring the garnish member **120** to the welding station **112**; setting the garnish member **120** in position relative to the structural component **114** in the welding station **112**; and welding the garnish member **120** directly to the structural component **114**. The exemplary method further comprises separately hemming the garnish member **120** to the structural component **114**. The exemplary method further comprises transferring the structural component **114** having the garnish member **120** welded thereto to a paining station **180** of the vehicle assembly line **104**; and simultaneously painting the structural component **114** together with the garnish member **120** welded thereto.

While, for purposes of simplicity of explanation, the method has steps shown and described as executing serially, it is to be understood and appreciated that the present disclosure is not limited by the illustrated order, and some steps

could occur in different orders and/or concurrently with other steps from that shown and described herein.

It will be appreciated that various of the above-disclosed and other features and functions, or alternatives thereof, may be desirably combined into many other different systems or applications. Also that various presently unforeseen or unanticipated alternatives, modifications, variations or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

What is claimed is:

1. A vehicle assembly comprising:

a structural component that defines a portion of a vehicle body, the structural component is formed of a first metal and includes an outer panel member secured to an inner panel member; and

a garnish member formed of the first metal and fixedly attached via welding or hemming directly to the outer panel member of the structural component in a same welding station of a vehicle assembly line as the assembly of the structural component, each of the outer panel member and the garnish member having an outer surface which defines an exterior surface of the vehicle body.

2. The vehicle assembly of claim **1**, wherein the garnish member is entirely formed of the first metal.

3. The vehicle assembly of claim **1**, wherein a first portion of the garnish member is welded to a body of the structural component.

4. The vehicle assembly of claim **3**, wherein a second portion of the garnish member is hemmed to an edge portion of the structural component.

5. The vehicle assembly of claim **3**, wherein the structural component is one of a trunk lid, a quarter panel, and a side panel.

6. The vehicle assembly of claim **5**, wherein the garnish member is one of a trunk lid skin, a fender, a slide door rail cover, and a side panel extension.

7. The vehicle assembly of claim **1**, further comprising paint covering the structural component and the outer surface of the garnish member fixedly attached thereto, wherein paint is simultaneously applied to the structural component and the garnish member in a painting station of the vehicle assembly line.

8. The vehicle assembly of claim **1**, wherein the garnish member is fixedly attached to the structural component without the use of an associated fastener or an associated bracket.

9. The vehicle assembly of claim **1**, wherein the garnish member is configured as a second structural component of the vehicle body.

10. A system for assembling a vehicle body comprising:

a vehicle assembly line having a plurality of stations including a welding station and a paint station located downstream of the welding station, the welding station is adapted to receive and weld an outer panel member to an inner panel member, the outer panel member and inner panel member together define a structural component of a vehicle body, the structural component is formed of a first metal, the same welding station is further adapted to receive a garnish member formed of the first metal and weld the garnish member directly to the outer panel of the structural component, the outer panel member together with the garnish member define an exterior surface of the vehicle body; and the painting station is adapted to receive and paint the structural component and the garnish member welded thereto.

11. The system of claim **10**, wherein the structural component is a trunk lid and the garnish member is a trunk lid skin.

12. The system of claim **10**, wherein the structural component is a quarter panel and the garnish member is a fender.

13. The system of claim **10**, wherein the structural component is a side panel and the garnish member is one of a slide door rail cover and a side panel extension.

14. The system of claim **10**, wherein the garnish member is hemmed to the structural component in the same welding station.

15. The system of claim **10**, wherein the garnish member is configured as a second structural component of the vehicle body adding strength to the structural component, the connection between the garnish member and the structural component being devoid of an associated fastener or an associated bracket.

16. A method of assembling a vehicle body comprising:

providing an outer panel member and an inner panel member in a vehicle assembly line, the outer panel member and the inner panel member together defining a vehicle body structural component formed of a first metal;

transferring the outer panel member and the inner panel member of the structural component to a welding station of the vehicle assembly line;

assembling the structural component by welding the outer panel member to the inner panel member in the welding station

providing a garnish member formed of the first metal, the garnish member defines an exterior surface of the vehicle body, and transferring the garnish member to the welding station;

setting the garnish member in position relative to the assembled structural component in the welding station; and

welding the garnish member directly to the structural component in the welding station.

17. The method of claim **16**, comprising:

transferring the structural component having the garnish member welded thereto to a paining station of the vehicle assembly line; and

simultaneously painting the structural component together with the garnish member welded thereto.

18. The method of claim **17**, wherein prior to transferring to the painting station the garnish member is fixedly attached to the structural component without the use of an associated fastener or an associated bracket.

19. The method of claim **16**, comprising separately hemming the garnish member to the structural component in the welding station.

20. The method of claim **16**, comprising forming the garnish member entirely of the first metal.

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